

SN 10/066,874
Page 2

CLAIM AMENDMENTS

1. (CURRENTLY AMENDED) An infrared radiation-sensitive composition comprising:
 - (a) a first polymeric binder which is free of acidic moieties ~~having a pKa value less than or equal to 8;~~
 - (b) a second polymeric binder comprising polyether moieties;
 - (c) an initiator system comprising:
 - (i) at least one infrared radiation absorbing material comprising a triarylamine dye, thiazolium dye, indolium dye, oxazolium dye, cyanine dye, polyaniline dye, polypyrrole dye, polythiophene dye or phthalocyanine pigment;
 - (ii) at least one polyhaloalkyl-substituted compound capable of producing radicals, wherein

$$\text{ox}_{(i)} < \text{red}_{(ii)} + 1.6\text{eV}$$

and wherein ox_i is the oxidation potential of the infrared radiation absorbing material in eV and red_{ii} is the reduction potential of the polyhaloalkyl-substituted compound in eV; and

- (iii) at least one compound represented by the formula I



wherein Y is O, S or NR^7 ,

each of R^4 , R^5 and R^6 is independently hydrogen, C_1 - C_4 alkyl, substituted or unsubstituted aryl, $-\text{COOH}$ or $\text{NR}^8\text{CH}_2\text{COOH}$,

R^7 is a hydrogen, C_1 - C_6 alkyl, $-\text{CH}_2\text{CH}_2\text{OH}$, or C_1 - C_5 alkyl substituted with $-\text{COOH}$, R^8 is $-\text{CH}_2\text{COOH}$, $-\text{CH}_2\text{OH}$ or $-(\text{CH}_2)_2\text{N}(\text{CH}_2\text{COOH})_2$, and r is 0, 1, 2

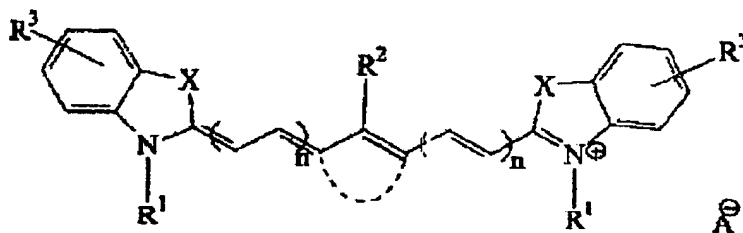
SN 10/066,874
Page 3

or 3, and wherein at least one of R^4 , R^5 , R^6 , R^7 and R^8 comprises a $-\text{COOH}$ moiety or salts thereof; and

- (d) a free radical polymerizable system comprising at least one unsaturated free radical polymerizable monomer, free radical polymerizable oligomer, or a polymer containing $\text{C}=\text{C}$ bonds in the back bone, side chains, or both.

2. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the infrared radiation absorbing material comprises a cyanine dye.

3. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the infrared radiation absorbing material is represented by the formula



wherein each X is independently S, O, NR or $\text{C}(\text{alkyl})_2$; each R^1 is independently alkyl, alkylsulfonate or alkylammonium; R^2 is hydrogen, halogen, SR, SO_2R , OR or NR_2 ; each R^3 is independently hydrogen, alkyl, COOR, OR, SR, NR_2 , halogen or optionally substituted benzofused ring; A^- is an anion; the dashed line (---) completes an optional carbocyclic five- or six-member ring; each R is independently hydrogen, alkyl or aryl; and each n is independently 0, 1, 2 or 3.

4. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the infrared radiation absorbing material comprises:

SN 10/066,874

Page 4

2-[2-[2-thiophenyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclopenten-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indolium tosylate;

2-[2-[2-phenylsulfonyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indolium chloride;

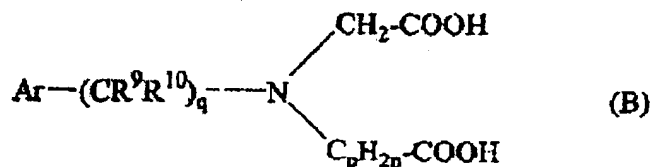
2-[2-[2-thiophenyl-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indolium chloride;

2-[2-[2-chloro-3-[2-(1,3-dihydro-1,3,3-trimethyl-2H-indol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-1,3,3-trimethyl-3H-indolium tosylate; or

2-[2-[2-chloro-3-[2-ethyl-(3H-benzothiazol-2-ylidene)-ethylidene]-1-cyclohexen-1-yl]-ethenyl]-3-ethyl-benzothiazolium tosylate.

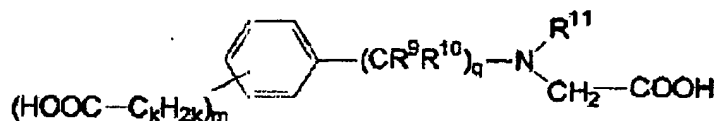
5. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the polyhaloalkyl-substituted compound comprises 2-(4-methoxyphenyl)-4,6-bis-(trichloromethyl)-s-triazine, 2-(4-chlorophenyl)-4,6-bis-(trichloromethyl)-s-triazine, 2-phenyl-4,6-bis-(trichloromethyl)-s-triazine, 2,4,6-tri-(trichloromethyl)-s-triazine, 2,4,6-tri-(tribromomethyl)-s-triazine, or tribromomethyl phenylsulfone.

6. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the compound represented by formula I comprises a compound represented by formula (B)



SN 10/066,874

Page 5



or a compound represented by formula C

wherein Ar is a mono-, poly- or unsubstituted aryl group, p is an integer (C) 1 to 5, each R^9 and R^{10} is independently hydrogen or C_1 - C_4 alkyl, q is 0 or an integer from 1 to 3, and wherein R^{11} is hydrogen or C_1 - C_6 alkyl, and k and m each are an integer from 1 to 5.

7. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the compound represented by formula I comprises anilino diacetic acid or N-(carboxymethyl)-N-benzyl-glycine.

8. (CANCELLED)

9. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the first polymeric binder comprises a main chain comprising at least one ester group or urethane group.

10. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the polyether groups of the second polymeric binder are derived from polyoxy alkenes.

SN 10/066,874

Page 6

11. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 10, wherein the polyoxy alkylenes comprise ethylene oxide or propylene oxide.

12. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, wherein the polyether groups of the second polymeric binder comprise at least one end group comprising -OH.

13. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, further comprising a leuco dye comprising a triarylmethane, thioxanthene, 9,10-dihydro-acridine or phenoxazine dye.

14. (PREVIOUSLY PRESENTED) The infrared radiation-sensitive composition of claim 1, further comprising at least one colorant comprising a rhodamine dye, triarylmethane dye, anthraquinone pigment, phthalocyanine dye, or a pigment.

15. (PREVIOUSLY PRESENTED) The radiation sensitive composition of claim 1, further comprising at least one softening agent.

16. (CURRENTLY AMENDED) A printing plate precursor comprising:

(A) a substrate;

(B) a negative-working bottom layer applied onto the substrate, comprising an IR-sensitive composition comprising a first polymeric binder which is free of acidic moieties, a second polymeric binder comprising polyether moieties and an initiator system comprising:

(i) at least one infrared radiation absorbing material comprising a triarylamine dye, thiazolium dye, indolium dye, oxazolium dye, cyanine dye, polyaniline dye, polypyrrole dye, polythiophene dye or phthalocyanine pigment;

SN 10/066,874

Page 7

(ii) at least one polyhaloalkyl-substituted compound capable of producing radicals, wherein

$$\text{ox}_{\text{ir}} < \text{red}_{\text{ii}} + 1.6\text{eV}$$

and wherein ox_{ir} is the oxidation potential of the infrared radiation absorbing material in eV and red_{ii} is the reduction potential of the polyhaloalkyl-substituted compound in eV; and

(iii) at least one compound represented by the formula I



wherein Y is O, S or NR^7 ,

each of R^4 , R^5 and R^6 is hydrogen, $\text{C}_1\text{-C}_4$ alkyl, substituted or unsubstituted aryl, -COOH or $\text{NR}^8\text{CH}_2\text{COOH}$, R^7 is $\text{C}_1\text{-C}_6$ alkyl, $\text{-CH}_2\text{CH}_2\text{OH}$, or $\text{C}_1\text{-C}_5$ alkyl substituted with -COOH , R^8 is $\text{-CH}_2\text{COOH}$, $\text{-CH}_2\text{OH}$ or $\text{-(CH}_2\text{)}_2\text{N(CH}_2\text{COOH)}_2$, and r is 0, 1, 2 or 3, and wherein at least one of R^4 , R^5 , R^6 , R^7 and R^8 comprises a -COOH moiety or salts thereof;

(C) a free radical polymerizable system comprising at least one unsaturated free radical polymerizable monomer, free radical polymerizable oligomer, or a polymer containing $\text{C}=\text{C}$ bonds in the back bone, in the side chains, or both.

(D) an oxygen-impermeable top layer applied onto the bottom layer, wherein the printing plate precursor is free of an infrared radiation-ablatable layer.

17-26. (CANCELLED)

SN 10/066,874

Page 8

27. (ORIGINAL) The printing plate precursor of claim 16, wherein the oxygen-impermeable layer comprises polyvinyl alcohol.

28. (PREVIOUSLY PRESENTED) The printing plate precursor of claim 16, wherein the oxygen-impermeable layer comprises behenic acid, behenic acid amide, or N,N'-diallyl tartardiamide.

29. (CANCELLED)

30. (CANCELLED)

31. (CURRENTLY AMENDED) A method for preparing an on-press developable printing plate, the method comprising:

(A) providing a substrate;

(B) applying a negative-working bottom layer comprising an infrared radiation-sensitive composition onto the substrate to form a printing plate precursor, wherein the radiation-sensitive composition comprises a first polymeric binder which is free of acidic moieties having a pKa value less than or equal to 8,

a second polymeric binder comprising polyether moieties,

an initiator system comprising at least one infrared radiation absorbing material, at least one compound capable of producing radicals and at least one compound represented by the formula I



wherein Y is O, S or NR⁷, each of R⁴, R⁵ and R⁶ is hydrogen, C₁-C₄ alkyl, substituted or unsubstituted aryl, -COOH or NR⁸CH₂COOH, R⁷ is hydrogen, C₁-C₆ alkyl, -CH₂CH₂OH, or C₁-C₅ alkyl substituted with -COOH, R⁸ is -CH₂COOH, -CH₂OH or -

SN 10/066,874

Page 9

$(\text{CH}_2)_r\text{N}(\text{CH}_2\text{COOH})_2$, and r is 0, 1, 2 or 3, and wherein at least one of R^4 , R^5 , R^6 , R^7 and R^8 comprises a $-\text{COOH}$ moiety or salts thereof; and a free radical polymerizable system;

- (C) applying an oxygen-impermeable top layer onto the bottom layer;
- (D) imagewise exposing the printing plate precursor to infrared radiation; and
- (E) developing the imagewise exposed printing plate precursor on-press without a separate development step or heating step, and wherein the printing plate is free of an infrared radiation laser ablatable layer.

32. (PREVIOUSLY PRESENTED) The method of Claim 31, wherein the initiator system further comprises

- (i) at least one infrared radiation absorbing material comprising a triarylamine dye, thiazolium dye, indolium dye, oxazolium dye, cyanine dye, polyaniline dye, polypyrrole dye, polythiophene dye or phthalocyanine pigment;
- (ii) at least one polyhaloalkyl-substituted compound capable of producing radicals, wherein

$$\text{ox}_{(i)} < \text{red}_{(ii)} + 1.6\text{eV}$$

and wherein ox_i is the oxidation potential the infrared radiation absorbing material in eV and red_{ii} is the reduction potential of the polyhaloalkyl-substituted compound in eV; and

wherein the free radical polymerizable system comprises at least one unsaturated free radical polymerizable monomer, free radical polymerizable oligomer, or a polymer containing C=C bonds in the backbone, side chains or both.

33-36. (CANCELLED)

SN 10/066,874

Page 10

37. (CURRENTLY AMENDED) A printing plate precursor comprising:
- a substrate;
 - an infrared radiation-sensitive layer comprising:
 - a first polymeric binder that is free of acidic groups ~~having a pKa value less than or equal to 8,~~
 - a second polymeric binder comprising polyether moieties,
 - an initiator system comprising an infrared radiation absorber, at least one compound capable of producing free radicals and at least one polycarboxylic compound; and
 - a free radical polymerizable system.
38. (PREVIOUSLY PRESENTED) The printing plate precursor of claim 37 further comprising an oxygen-impermeable layer applied onto the infrared radiation-sensitive layer.
39. (CANCELLED)
40. (CANCELLED)
41. (NEW) The infrared radiation-sensitive composition of claim 1 comprising between about 3 and 30 weight percent of the second polymeric binder based on the total solids content of the composition.
42. (NEW) The infrared radiation-sensitive composition of claim 1 comprising between about 10 and 20 weight percent of the second polymeric binder based on the total solids content of the composition.
43. (NEW) The infrared radiation-sensitive composition of claim 1 wherein the first polymeric material is derived from at least one monomer selected from the group consisting of 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, methacrylate, methylmethacrylate, N-dimethylaminoethylacrylate and N-dimethylaminoethylmethacrylate.

SN 10/066,874

Page 11

44. (NEW) The infrared radiation-sensitive composition of claim 1 wherein the first polymeric material is derived from at least one monomer selected from the group consisting of acrylamide, methacrylamide, N-methylolacrylamide, N-hydroxyethylacrylamide and N-ethylacrylamide.

45. (NEW) The infrared radiation-sensitive composition of claim 1 wherein the first polymeric material comprises at least one of polyesters or polyurethanes.

46. (NEW) The printing plate precursor of claim 16 wherein the second polymeric material comprises between about 3 and about 30 weight percent of the radiation-sensitive layer.

47. (NEW) The printing plate precursor of claim 16 wherein the second polymeric material comprises between about 10 and about 20 weight percent of the radiation-sensitive layer.

48. (NEW) The printing plate precursor of claim 37 wherein the second polymeric material comprises between about 3 and about 30 weight percent of the radiation-sensitive layer.

49. (NEW) The printing plate precursor of claim 37 wherein the second polymeric material comprises between about 10 and about 20 weight percent of the radiation-sensitive layer.

50. (NEW) An infrared radiation-sensitive composition comprising:

- (d) a first polymeric binder comprising at least one acrylate, methacrylate, acrylamide or methacrylamide.
- (e) a second polymeric binder comprising polyether moieties;
- (f) an initiator system comprising:
 - (i) at least one infrared radiation absorbing material comprising a triarylamine dye, thiazolium dye, indolium dye, oxazolium dye, cyanine

SN 10/066,874

Page 12

dye, polyaniline dye, polypyrrole dye, polythiophene dye or phthalocyanine pigment;

- (ii) at least one polyhaloalkyl-substituted compound capable of producing radicals, wherein

$$ox_{(i)} < red_{(ii)} + 1.6eV$$

and wherein ox_i is the oxidation potential of the infrared radiation absorbing material in eV and red_{ii} is the reduction potential of the polyhaloalkyl-substituted compound in eV; and

- (iii) at least one compound represented by the formula I



wherein Y is O, S or NR^7 ,

each of R^4 , R^5 and R^6 is independently hydrogen, C_1 - C_4 alkyl, substituted or unsubstituted aryl, $-COOH$ or NR^8CH_2COOH ,

R^7 is a hydrogen, C_1 - C_6 alkyl, $-CH_2CH_2OH$, or C_1 - C_5 alkyl substituted with $-COOH$, R^8 is $-CH_2COOH$, $-CH_2OH$ or $-(CH_2)_2N(CH_2COOH)_2$, and r is 0, 1, 2 or 3, and wherein at least one of R^4 , R^5 , R^6 , R^7 and R^8 comprises a $-COOH$ moiety or salts thereof; and

- (d) a free radical polymerizable system comprising at least one unsaturated free radical polymerizable monomer, free radical polymerizable oligomer, or a polymer containing $C=C$ bonds in the back bone, side chains, or both.